

IN THE CLAIMS

Claims 5-19 are pending in this application. Please cancel claims 1-4 without prejudice or disclaimer, and amend claims 5 and 8-11 as follows:

1-4. (Canceled)

5. (Currently Amended) ~~[[The]]~~ A channel estimation method for a mobile communication system, in which a receiving apparatus obtains an channel estimation uses to obtain a channel estimation result for use in detection of a data signal received from a transmitting apparatus according to claim 2,

wherein said receiving apparatus receives a data signal containing a plurality of data symbols from said transmitting apparatus, estimates a data signal channel condition for each data symbol of said received data signal and detects said received data signal for each of said data symbol in accordance with the estimation result,

wherein said receiving apparatus receives a pilot signal from said transmitting apparatus and uses said pilot signal to estimate said channel,

wherein said pilot signal is sampled at a rate lower than a symbol rate of said data signal, and the sampled pilot signal is interpolated into the symbol rate of said data signal using an FIR filter operating at the symbol rate of said data signal and entered into the FIR filter, and wherein the output of the filter is used as a channel estimation result.

6. (Original) The channel estimation method according to claim 5, wherein the coefficient of said FIR filter is determined in accordance with an impulse response, which is determined by a Fourier transform of predetermined low-pass characteristics.

7. (Original) The channel estimation method according to claim 5, wherein said pilot signal is on the same channel as for said data signal and inserted between the symbols of said data signal at predetermined intervals for transmission.

8. (Currently Amended) The channel estimation method according to claim ~~[[2]]~~5, wherein the symbol rate of said pilot signal is equal to the symbol rate of said received data signal.

9. (Currently Amended) The channel estimation method according to claim [[2]]5, wherein said pilot signal is passed through a low-pass filter having a passband of a specified frequency and lower frequencies and used for channel estimation.
10. (Currently Amended) The channel estimation method according to claim [[1]]5, wherein said received data signal is multilevel-modulated by said transmitting apparatus.
11. (Currently Amended) A receiving apparatus in a mobile communication system, comprising:
 - a channel estimator for estimating the channel variation between a transmitting apparatus and the receiving apparatus in accordance with a received signal;
 - a detector for detecting the received signal in accordance with an estimation result produced by said channel estimator; and
 - a demodulator for demodulating said detected received signal,wherein said received data signal includes a plurality of data symbols;
wherein said channel estimator ~~operates~~ is configured to perform channel estimation for each data symbol, said channel estimator operating at a data symbol rate of said received data signal ~~to perform channel estimation for each data symbol;~~
and
wherein said detector detects said received data signal for each of said data symbol.
12. (Original) The receiving apparatus according to claim 11, wherein said channel estimator estimates said channel variation using a pilot signal received from said transmitting apparatus.
13. (Original) The receiving apparatus according to claim 12, wherein said channel estimator estimates the amplitude variation or phase rotation with a propagation for said received signal in accordance with said pilot signal.

14. (Original) The receiving apparatus according to claim 12, wherein said channel estimator comprises a plurality of series-connected delay devices for delaying an entered pilot signal, a plurality of multipliers for multiplying the outputs of said plurality of delay devices by a plurality of predetermined coefficients, and an adder for adding up the outputs of said plurality of multipliers, and operates at a symbol rate of said data signal and uses the output of said adder to estimate said channel variation.
15. (Original) The receiving apparatus according to claim 14, wherein said pilot signal is entered into said channel estimator after being sampled at a rate lower than the symbol rate of said data signal, wherein said entered pilot signal is interpolated into the symbol rate of said data signal using a predetermined value, and wherein the resulting interpolated signal is entered into a plurality of delay devices.
16. (Original) The receiving apparatus according to claim 15, wherein the coefficients of said plurality of multipliers are determined in accordance with an impulse response, which is determined by a Fourier transform of predetermined low-pass characteristics.
17. (Original) The receiving apparatus according to claim 14, wherein at least one of said plurality of coefficients is a negative value.
18. (Original) The receiving apparatus according to claim 14, wherein said channel estimator comprises a plurality of series-connected delay devices for delaying an entered pilot signal, a plurality of multipliers which are smaller in number than the delay devices and used for multiplying the outputs of said plurality of delay devices by a plurality of predetermined coefficients, and an adder for adding up the outputs of said plurality of multipliers, and operates at a symbol rate of said data signal and uses the output of said adder to estimate said channel variation.
19. (Original) The receiving apparatus according to claim 12, wherein said channel estimator includes a low-pass filter for passing a pilot signal for use in said channel estimation.